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## ERRATA NOTICE

**EOS Core System (ECS) Project Contract No. NAS5-60000**

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**Document No.:** 814-RD-007-006

**Title:** Flight Operations Segment (FOS) Release A Version Description Document (VDD) for the ECS Project

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814-RD-007-006

## **EOSDIS Core System Project**

# **Flight Operations Segment (FOS) Release A Version Description Document (VDD) for the ECS Project**

Version 1.01.01

February 21, 1997

Hughes Information Technology Systems  
Upper Marlboro, Maryland

# **Flight Operations Segment (FOS) Release A Version Description Document (VDD) for the ECS Project**

**Version 1.01.01**

**February 21, 1997**

Prepared Under Contract NAS5-60000

## **SUBMITTED BY**

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814-RD-007-006

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# Preface

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This document accompanies the delivery of the Earth Observing System (EOS) Flight Operations Segment (FOS) Version 1.01.01 patch software for the ECS project. This document describes the configuration of the Version 1.01.01 patch and the delta changes since the release of Version 1.01.00. This document reflects updates to software released as of February 19, 1997.

It is not a formal deliverable and does not require Government approval. However, it has been placed under configuration control by the EOSDIS Core System (ECS) Change Control Board (CCB). Changes to this document shall be made by document change notice (DCN) or by complete revision.

Any questions regarding distribution should be addressed to:

Data Management Office  
The ECS Project Office  
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# Abstract

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This document describes the configuration of delivery contents for the FOS patch Version 1.01.01 and the delta changes since the release of Version 1.01.00. It reflects updates to software released as of February 19, 1997. Since this document version only addresses the patch, it augments the version delivered with the baseline Release A System (version 1.00.00) and is not considered a full replacement.

The purpose of this document is to describe the contents of the FOS patch delivery. It briefly describes the capabilities of the product, provides an inventory of the delivery, lists unresolved problems, and addresses issues such as special operating instructions, and disclaimer notices for public domain software used in the product.

**Keywords:** CCB, deliver, EOC, ECL, description, instructions, inventory, FOT, FOS, manual, operations, problems, release, software, tools, user's, version, IST

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# **1. Introduction**

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## **1.1 Identification of Document**

This is a Version Description Document (VDD) prepared using NASA-STD-2100-91 (NASA-DID-P500, NASA form DD250) as a guide. It is submitted as part of Flight Operations Segment (FOS) delivery for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), contract number NAS5-60000.

## **1.2 Scope of Document**

This document describes the contents of the FOS patch 1.01.01 delivery including any new or modified COTS, custom FOS ECS software, and accompanying documentation.

## **1.3 Purpose and Objectives of Document**

The purpose of this document is to describe the contents of the FOS patch delivery. It briefly describes the capabilities of the product, provides an inventory of the delivery, lists unresolved problems, and addresses issues such as special operating instructions, system limitations, and disclaimer notices for public domain software used in the product.

## **1.4 Document Status and Schedule**

This VDD is submitted as a final document. Any changes to the product that require a subsequent version of this document to be released will be described in a new VDD.

## **1.5 Document Organization**

The format and contents of this document comply with NASA-DID-P500 and NASA-DID-999 as defined in NASA-STD-2100-91.

- Introduction — Introduces the VDD scope, purpose, objectives, status, schedule and document organization.
- Related Documentation — Provides a bibliography of reference documents for the VDD organized by parent and binding subsections.
- Product Description — Describes the general capabilities and product contents.
- Inventory — Lists product inventory including COTS and custom FOS software (contents of tar file) as appropriate.
- Non-conformance Status — Discusses known problems with the FOS software that are fixed with this delivery.

- Appendices — Contain supplemental information such as: build/installation instructions, problem reporting, and public software disclaimer notices.
- Abbreviations and Acronyms — Contains an alphabetized list of the definitions for abbreviations and acronyms used in this volume.



## 2. Related Documentation

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### 2.1 Parent Document

The parent documents are the documents from which the scope and content of this document is derived.

423-42-01	EOSDIS Core System Statement of Work - CN10
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)
NASA-STD-2100-91	NASA Software Documentation Standard, Software Engineering Program

### 2.2 Applicable Documents

The following documents are referenced within this document, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume.

194-207-SE1-001	System Design Specification for the ECS Project
304-CD-001-003	Flight Operations Segment (FOS) Requirement Specified for the ECS Project, Volume 1: General Requirements
305-CD-040-001	Flight Operations Segment (FOS) Design Specification for the ECS Project (Segment Level Design)
307-CD-001-003	Flight Operations Segment (FOS) Release Plan and Development Plan for the ECS Project
329-CD-001-003	

### 2.3 Information Documents

The following documents are referenced herein and, amplify or clarify the information presented in this document. These documents are not binding on the content of the Version Description Document.

222-TP-003-008	Release Plan Content Description for the ECS Project
320-WP-001-003	Flight Operation Segment (FOS) Commercial-off-the-Shelf (COTS) Hardware for Release A
604-CD-001-004	Operations Concept for the ECS Project: Part 1: - ECS Overview
604-CD-004-001	ECS Operations Concept for the ECS Project: Part 2, FOS
609-CD-005-001	Flight Operations Segment (FOS) Operations Tool Manual
SD-1-014	Software Nonconformance Reporting Project Instruction

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## 3. Product Description

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This section describes the product capabilities of the FOS ECS software.

### 3.1 Product Description and General Capabilities

FOS Release A software was deployed November 1996 at the EOS Operation Center (EOC) located at Goddard Space Flight Center (GSFC).

FOS is responsible for mission operations, including the planning, scheduling, commanding, and monitoring of US EOS spacecraft and US EOS instruments onboard the US and International Partner (IP) series of spacecraft. FOS is composed of the EOS Operations Center (EOC) located at GSFC and Instrument Support Toolkit (IST) associated with the Principal Investigations (PIs) and Team Leaders (TLs).

Nine subsystems have been defined to support flight operations. Individually these subsystems perform specific, unique functions; collectively, they provide a set of interrelated services for the Flight Operations Team (FOT) and the IST user community. These subsystems are:

1. Analysis Subsystem (ANA)
2. Command Subsystem (CMD)
3. Command Management Subsystem (CMS)
4. Data Management Subsystem (DMS)
5. FOS User Interface Subsystem (FUI)
6. Planning and Scheduling Subsystem (PAS)
7. Real-Time Contact Management Subsystem (RCM)
8. Resource Management Subsystem (RMS)
9. Telemetry Subsystem (TLM)

The following sections describe the product capabilities in further detail.

#### 3.1.1 Analysis Subsystem (ANA)

The ANA subsystem provides statistics generation, User Supplied Algorithm processing, a Decision Support System (DSS), Routine Request Processing, Carryout Data, and Clock Correlation Process. The ANA subsystem is responsible for managing the on-board systems and for the overall mission monitoring. Its functions include performance analysis and trend analysis. It also cooperates with Telemetry to support fault detection and isolation.

### **3.1.2 Command Subsystem (CMD)**

The CMD subsystem consists of three processes: Format Command, Frame Operation Procedure (FOP) Command, and Transmit Command. Format Command receives and validates command directives. FOP Command builds command link transmission units (CLTUs) according to the Consultative Committee for Space Data Systems (CCSDS) standard. Transmit command forwards the CLTUs at a specified uplink rate. CMS is responsible for transmitting command data (i.e., Real-Time commands or command loads) to EDOS for uplink to the spacecraft during each real-time contact. Command data can be received in real-time by the operational staff or as preplanned command groups generated by Command Management. The CMD subsystem is also responsible for verifying command execution on-board the spacecraft.

### **3.1.3 Command Management Subsystem (CMS)**

The CMS subsystem contributes a Schedule Controller process, a Command Model process, a Spacecraft Model process, a Ground Schedule process, and a Load Catalog process. CMS manages the preplanned command data for the spacecraft and instruments. Based on inputs received from Planning and Scheduling, Command Management collects and validates the commands, software memory loads, tables loads, and instrument memory loads necessary to implement the instrument and spacecraft scheduled activities.

### **3.1.4 Data Management Subsystem (DMS)**

This subsystem provides the Project Data Base Management processes, Event Processing, Telemetry Archive Process, Ground Telemetry Archive Process, and External Interface Processes. DMS is responsible for maintaining and updating the Project Data Base (PDB) and the FOS history log.

### **3.1.5 FOS User Interface Subsystem (FUI)**

This provides graphical user interface services for all of the FOS subsystems. FUI provides character-based and graphical display interfaces for FOS operators interacting with all of the aforementioned FOS subsystems.

### **3.1.6 Planning and Scheduling (PAS)**

This produces a conflict-free schedule of activities for spacecraft resources. PAS integrates plans and schedules for spacecraft, instruments, and ground operations. Planning and Scheduling provides the operational staff with a common set of capabilities to perform "what-if" analyses and to visualize plans and schedules.

### **3.1.7 Real-Time Contact Management Subsystem (RCM)**

This receives and processes messages from NCC during contact. It also sends request messages to NCC during contact. Status messages are also received and processed from EDOS during contact. RCM is responsible for managing the real-time interface with the NCC and EDOS, as well as with the DSN station, as applicable.

### **3.1.8 Resource Management Subsystem (RMS)**

This provides multiple operators access to the same data stream. It also ensures a single point of command for a specific spacecraft. RMS provides the capability to manage and monitor the configuration of the EOC. This includes configuring the EOC resources for multi-mission support; facilitating operational failure recovery during real-time contacts.

### **3.1.9 Telemetry Subsystem (TLM)**

This provides telemetry decommutation. It also provides for memory dump and spacecraft state checks. TLM receives and processes housekeeping telemetry (in CCSDS packets) from EDOS. After the packet decommutation, the telemetry data is converted to engineering units and checked against boundary limits.

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## 4. Product Inventory

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Delivery of FOS generally consists of commercial-off-the shelf (COTS) software, shareware software and custom ECS software. This section provides details of these components.

### 4.1 Inventory of Materials

#### 4.1.1 Documentation

No additional documents are being provided with this VDD.

#### 4.1.2 Archive Tapes

The following magnetic tape is used to archive the delivered baseline configuration of the developed software.

##### 904-PR-030-003

Tape label: FOS\_v1.01.01\_21997

Distribution Date: February 19, 1997

>>> 5.0gbyte format (high density) <<<

Filenames: NCC1\_patch.tar

#### 4.1.3 Utility and Support Software

The Utility and Support Software are included as part of the FOS Custom Software (refer to section 4.2.1).

#### 4.1.4 COTS Software Inventory

Table 4-1 summarizes the deployed COTS software at GSFC. Refer to *Flight Operation Segment (FOS) Commercial-off-the-Shelf (COTS) Hardware for Release A* (320-WP-001-003) for the physical mapping of FOS Release A COTS hardware to COTS software.

There are no COTS changes with this delivery.

**Table 4-1. COTS Software Inventory List (GSFC)**

Identification:	Component Description	Version	Patches	Vendor	Part Number
CSS-EOC-1 (CSS Server)	HP-UX Operating System	9.05			
	Motif	1.2			
ISS-EOC-1 (Interworking Equipment)	None Identified				
FOS-EOC-1 (Printer)	None Identified				

**Table 4-1. COTS Software Inventory List (GSFC) cont.**

Identification:	Component Description	Version	Patches	Vendor	Part Number
FOS-EOC-2 (RAID File Server)	Digital UNIX Operating System	3.2	-	DEC	
	Network Applications Support	N/A	-	DEC	
	OSF/Motif Base Software	1.2	-	DEC	
	OSF/Motif USR Digital Unix, 8 user	N/A	N/A	DEC	
	Jukebox Tier 1	N/A	N/A	DEC	
	Advanced File System Utilities	N/A	N/A	DEC	
FOS-EOC-3 (Printer)	None Identified				
FOS-EOC-4 (Printer)	None Identified				
FOS-EOC-5 (FOT User Station)	RogueWave libraries	7.0.3			
	Sybase Client	10.0.2			
	Netscape Browser	2.02			
	Solaris Operating System	2.4		SUN	
	Motif	1.2.3			
FOS-EOC-6 (Real Time Server)	Digital UNIX Operating System	3.2	-	DEC	
	Polycenter Netview Base System	4.1A	-	DEC	
	DEC Fuse For OSF-1	2.1A	-	DEC	
	DEC Fuse For OSF-1 c/user	2.1A	-	DEC	
	Network Application Support	N/A	-	DEC	
	OSF/Motif Base Software	1.2	-	DEC	
	DEC OSF-1 AXP Developers Ext.	N/A	-	DEC	
	OSF/Motif USR Digital Unix, 8 user	N/A	N/A	DEC	
	DEC C++ For U/A	5.1	-	DEC	
	Sybase SQL Server	10.0.2	-	-	-
	Sybase Open Client/C	10.0.2	-	-	-
	Sybase Embedded SQL/C	10.0.2	-	-	-
FOS-EOC-7 (Data Server)	Digital UNIX Operating System	3.2		DEC	
	Polycenter Netview Base System	4.1A	-	DEC	
	DEC Fuse For OSF-1	2.1	-	DEC	
	Network Application Support	N/A	-	DEC	
	OSF/Motif Base Software	1.2	-	DEC	
	DEC OSF-1 AXP Developers Ext.	N/A	N/A	DEC	
	OSF/Motif USR Digital Unix, 8 user	N/A	N/A	DEC	
	DEC C++ For U/A	5.1		DEC	
	Sybase SQL Server	10.0.2	-	-	-
	Sybase Open Client/C	10.0.2	-	-	-
	Sybase Embedded SQL/C	10.0.2	-	-	-
FOS-EOC-8 (FOT User Station)	Solaris Operating System	2.4	-	SUN	
	Motif	1.2.3			
	RogueWave libraries	7.0.3			
	Sybase Client	10.0.2			



**Table 4-1. COTS Software Inventory List (GSFC) cont.**

Identification:	Component Description	Version	Patches	Vendor	Part Number
	Netscape Browser	2.02			
FOS-EOC-9 (FOT User Station)	Solaris Operating System	2.4	-	SUN	
	Motif	1.2.3			
	RogueWave libraries	7.0.3			
	Sybase Client	10.0.2			
	Netscape Browser	2.02			
FOS-EOC-10 (FOT User Station)	Solaris Operating System	2.4	-	SUN	
	Motif	1.2.3			
	RogueWave libraries	7.0.3			
	Sybase Client	10.0.2			
	Netscape Browser	2.02			
FOS-EOC-11 (Console Manager)	Digital UNIX Operating System	3.2	-	DEC	
	Open 3D	N/A	-	DEC	
	Multimedia Services RT-DEC OSF-1	N/A	-	DEC	
	OSF-BASE	N/A	-	DEC	
FOS-EOC-12 (Console Manager)	Open 3D	N/A	-	DEC	
	Multimedia Services RT-DEC OSF-1	N/A	-	DEC	
	Digital UNIX Operating System	3.2	-	DEC	
FOS-EOC-13 (Time Gateways)	None Identified				
MSS-EOC-1 (Printer)	None Identified				
MSS-EOC-2 Management Subsystem Workstation	RogueWave Libraries	7.0.3			
	Netscape Browser	2.02			
	Motif	1.2.3	-	SUN	
MSS-EOC-3 (Management Subsystem Server)	HP-UX Operating System	9.05	-	HP	
	Motif	1.2	-	HP	
MSS-EOC-4 Multicast Server					
	Solaris Operating System	2.4	-	SUN	
	Motif	1.2.3			
	RogueWave Libraries	7.0.3			
	Netscape Browser	2.02			
	Sybase Client	10.0.2	-		

#### 4.1.5 Shareware Inventory

Table 4-2 summarizes the deployed Shareware at GSFC EOC. Refer to *Flight Operation Segment (FOS) Commercial-off-the-Shelf (COTS) Hardware for Release A* (320-WP-001-003) for the physical mapping of FOS Release A COTS hardware to shareware.

There is no new shareware delivered with the version 1.01.01 patch. The table continues to be provided as a reference to shareware delivered in support of the baseline delivery.

**Table 4-2. Shareware Inventory List (GSFC)**

Identification:	Component Description	Version	Patches	Vendor	Part Number
CSS-EOC-1 (CSS Server)	None Identified				
ISS-EOC-1	None Identified				
FOS-EOC-1	None Identified				
FOS-EOC-2 (RAID File Server)	None Identified				
FOS-EOC-3	None Identified				
FOS-EOC-4	None Identified				
FOS-EOC-5	Mosaic	2.4			
	emacs	19.28.1		GNU	
	ghostview	1.5		GNU	
	gzip	1.2.4		GNU	
	gunzip	1.2.4		GNU	
	sudo	1.3.1pl4			
	zmail	None identified			
	gcc	2.6.0			
	XV	None identified			
FOS-EOC-6	tcpdump	3.2.1			
FOS-EOC-7 (Data Server)	tcpdump	3.2.1			
FOS-EOC-8 (FOT User Station)	Mosaic	2.4			
	emacs	19.28.1		GNU	
	ghostview	1.5		GNU	
	gzip	1.2.4		GNU	
	gunzip	1.2.4		GNU	
	sudo	1.3.1pl4			
	zmail	None identified			
	XV	None identified			

**Table. 4-2. Shareware Inventory List (GSFC) cont.**

Identification:	Component Description	Version	Patches	Vendor	Part Number
FOS-EOC-9 (FOT User Station)	emacs	19.28.1		GNU	
	ghostview	1.5		GNU	
	gzip	1.2.4		GNU	
	gunzip	1.2.4		GNU	
	sudo	1.3.1pl4			
	zmail	None identified			
	XV	None identified			
FOS-EOC-10 (FOT User Station)	Mosaic	2.4			
	emacs	19.28.1		GNU	
	ghostview	1.5		GNU	
	gzip	1.2.4		GNU	
	gunzip	1.2.4		GNU	
	sudo	1.3.1pl4			
	zmail	None identified			
	XV	None identified			
FOS-EOC-11(Console Manager)	None Identified				
FOS-EOC-12 (Console Manager)	None Identified				
FOS-EOC-13	None Identified				
MSS-EOC-1	None Identified				
MSS-EOC-2 Management Subsystem Workstation	Mosaic	2.4			
	emacs	19.28.1		GNU	
	ghostview	1.5		GNU	
	gzip	1.2.4		GNU	
	gunzip	1.2.4		GNU	
	sudo	1.3.1pl4			
	zmail	None identified			
	XV	None identified			
MSS-EOC-3 Management Subsystem Server	Traceroute	None Identified			
	gzip	1.2.4		GNU	
	Kerberos	5		Cygnus	
MSS-EOC-4	Sudo	1.3.1pl4			

## 4.2 FOS Custom Software

FOS custom software consists of a number of components. Ten subsystems are required to make a complete FOS build. The software is available for the following architectures:

- DEC  
OSF 3.2
- SUN  
Sun Solaris 2.4

A file listing may be generated from the delivered tar file using the tar -tvf command.

### 4.2.1 FOS Custom Software Version 1.01.01 Patch File Listing

The following listing provides the version 1.01.01 patch files generated by the build process and the installation process. The directory listing in Appendix E contains the delivered custom software required to support the EOC operation and is available from delivered TAR tapes. The directory listing supporting this patch is a subset of the delivered TAR tape.

A description of the software functionality that has been corrected in this patch is described in section 5.1.1. The specific source code that was changed is identified below.

This list is further separated by the following categories:

- Executables
- Service Files
- Data Files
- Database Files
- Scripts/Setup Files
- Source Files

The source files provided are identified by FOS subsystems as follows:

- DMS4 — Data Management Subsystem

#### Executables

.../FdDbBuildNccOdf

#### Service Files

N/A

#### Data Files

.../packet\_defs\_data.sql

#### Database Files

N/A

#### Script/Setup Files

N/A

#### Source Files

.../FdDbBuildNccOdf.C

.../FdDbBuildNccOdfMain.C

### **4.2.2 FOS Custom Software Copyright Notice**

The archive tape delivered with this document contains a tar file and a copyright file. The name of the copyright file is ECS\_COPYRIGHT.asc. The content of the copyright file follows:

Copyright (c) 1996 Hughes Information Systems Company  
(portions contributed by ECS subcontractors) Unpublished work  
This work sponsored under Contract NAS5-60000 with NASA GSFC.  
ALL RIGHTS RESERVED

Please be advised that this software is still considered developmental.  
HITS Civil Systems in no way warrants this code against possible defects.  
This software is to be used only for the purpose for which it was released.  
Any further release or reuse must be authorized by Civil Systems according  
to the terms and conditions of the NAS5-60000 contract. Certain COTS  
products and licenses may be required for operation.

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## 5. Non-Conformance Status

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### 5.1 Non-Conformance Status Overview

This section contains the list of problems closed (section 5.2) as of 2/19/97 with this patch delivery. These problems were found and recorded during development and integration testing and captured in the formal problem tracking system, Distributed Defect Tracking System (DDTS). This list has been reviewed by HITC management and the FOS system is considered to be acceptable for delivery at this time. The list includes the NCR ID, Software, Title, Severity, and Problem description. DDTS problem severity definitions, on a 1-5 scale, are defined as follows:

- 1 Catastrophic bug without workaround that causes total failure or unrecoverable data loss.  
Example: system crash or lost user data.
- 2 Bug which severely impairs functionality. Workaround might exist but is unsatisfactory.  
Example: can not use major product function.
- 3 Bug that causes failure of noncritical system aspects. There is a reasonably satisfactory workaround.  
Example: user data must be modified to work.
- 4 Bug of minor significance. Workaround exists or, if not, the impairment is slight.  
Example: error messages are not very clear.
- 5 Very minor defect. Workaround exists or the problem can be ignored.  
Example: bad layout or misuse of grammar in manual.

#### 5.1.1 Installed Changes

FOS is delivering the NCC1 patch with this VDD. The purpose of the NCC1 patch is to address the NCR that was identified during NCC1 test preparation and fixed as part of this patch. The key problem corrected in this patch includes:

- Modifications to correct the data used to build messages passed to the NCC by the RCM NCC process.

A listing of the set of NCRs corrected in this patch are included in section 5.2

### 5.2 FOS Non-Conformance Reports (Closed Status)

This section summarizes the NCRs closed with delivery of the NCC1 patch (version 1.01.01). One NCR has been closed with the delivery of this patch.

**NCR ID:** ECSed05106  
**Software:** r/t NCC  
**Title:** GCMR's received by NCCDS contained error parameters  
**Severity:** 2  
**Problem:** The GCMR's received by NCCDS contained numerous invalid parameters.

### **5.3 FOS Non-Conformance Reports (Open Status)**

To obtain the status of the remaining open NCRs, the DDTS system can be accessed from the following WEB page:

*<http://newsroom.sit/ddts/ddts.html>*



# Appendix A. Build Instructions

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This appendix describes the necessary build procedures which will be used for installing the FOS custom software released by the Configuration Management Organization (CMO) at the EOC. The system build takes place at the Landover facility utilizing the ClearCase CM tool. Configuration management of the source files used to build executables is maintained at the Landover facility. Executables produced as a result of the build process are delivered to the EOC. Installation of the executables and supporting data/configuration files are discussed in Appendix B.

## A.1 Build Process

The FOS custom software build process is performed in order to generate a new set of executables. These files are subsequently loaded into specific workstations and file servers in order to meet the functional requirements of the FOS program.

The build process inputs consist of the following:

1. ClearCase views for each sub-system
2. The correct file versions dictated by the views' configuration specification
3. The pertinent NCRs that were addressed by the build

Scripts are invoked in order to perform the builds. There are two ways of actually doing this. One is by using an enhanced version of ClearCase's Graphical User Interface (GUI). The other is by keying in commands and executing them in a Command Line Interface (CLI). The GUI performs the same commands as the CLI, however the GUI executes the scripts by pointing and clicking a mouse, rather than keying in all of the detail UNIX and Cleartool commands.

The FOS custom software is partitioned into ten (10) areas. The first partition is known as FOSCOMMON, and is comprised of common code that is referenced by the remaining nine subsystems. The nine subsystems are:

- Analysis Subsystem (ANA)
- Command Subsystem(CMD)
- Command Management Subsystem (CMS)
- Data Management Subsystem (DMS)
- FOS User Interface Subsystem (FUI)
- Planning and Scheduling Subsystem (PAS)
- Real-Time Contact Management Subsystem (RCM)
- Resource Management Subsystem (RMS)
- Telemetry Subsystem (TLM)

FOSCOMMON is built *first*. DMS is built *last*. Other than these two constraints, the build order is arbitrary. Each subsystem is built by performing the following five steps:

- Set the view
- Set the path to the subsystem
- Specify the target platform (Sun or DEC)
- Source the .buildrc file
- Enter `Clearmake -C GNU -V`

The CLI interface commands are located in the /scripts/ area. The xclearcase GUI enhanced menu, Configuration Management/Change Control (CM/CC), performs all of the housekeeping for building FOS custom software.

## A.2 GUI Build Process

The GUI build process is described below:

1. Ensure that the cm-cc.grp menu file resides in /home/\$USER/grp path
2. Run “xclearcase” from a licensed node

voyager{user}6: xclearcase &

Using the menu, select the view needed for building FOSCOMMON, expand the menu to fill the monitor by clicking the larger upper right corner button. Ensure that the subsystem make.targets file has the target platform set.

3. Click on “CM/CC”
4. Click on “Build FOS S/W”
5. Click on “Foscommon”
6. Display the transcripts window to provide visibility to the FOSCOMMON build.

The FOSCOMMON build is complete when the build-foscommon script finishes. For each of the remaining nine subsystems, perform the following steps:

7. Using the menu, select the view needed for building the next subsystem
8. Ensure that the subsystem make.targets file has the target platform set
9. Click on “CM/CC”
10. Click on “Build FOS S/W”
11. Click on the next subsystem
12. Display the transcripts window to provide visibility to the subsystem build. The FOSCOMMON build is complete when the build-subsystem script finishes

A record of the build is saved into a logfile, named /home/\$USER/logfile. This file can be saved and printed to record the build process for Quality Assurance purposes.

## A.3 CLI Build Process

The CLI build process is described below:

1. Build FOSCOMMON:

Enter the command: `cleartool setview {appropriate view tag}`

2. Set the correct path for FOSCOMMON: `cd /ecs/formal/fos/foscommon2`
3. Ensure that the subsystem `make.targets` file has the target platform set. Enter the command: `source .buildrc`
4. Enter the command: `Clearmake -C GNU -V`

FOSCOMMON build is complete when the Clearmake finishes. For the remaining nine subsystems, perform the following steps:

### A.3.1 Build ANA

1. Enter the command:

`cleartool setview {appropriate view tag}`

2. Set the correct path for ANA: `cd /ecs/formal/fos/ana2`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

ANA build is complete when the Clearmake finishes

### A.3.2 Build CMD

1. Enter the command:

`cleartool setview {appropriate view tag}`

2. Set the correct path for CMD: `cd /ecs/formal/fos/cmd2`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

CMD build is complete when the Clearmake finishes

### A.3.3 Build CMS

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for CMS: `cd /ecs/formal/fos/cms`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

CMS build is complete when the Clearmake finishes

### A.3.4 Build FUI

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for FUI: `cd /ecs/formal/fos/fui3`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

FUI build is complete when the Clearmake finishes

### A.3.5 Build PAS

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for PAS: `cd /ecs/formal/fos/pas`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

PAS build is complete when the Clearmake finishes

### A.3.6 Build RCM

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for RCM: `cd /ecs/formal/fos/rcm3`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

RCM build is complete when the Clearmake finishes

### A.3.7 Build RMS

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for RMS: `cd /ecs/formal/fos/rms2`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

RMS build is complete when the Clearmake finishes

### A.3.8 Build TLM

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for TLM: `cd /ecs/formal/fos/tlm2`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

TLM build is complete when the Clearmake finishes

### A.3.9 Build DMS

1. Enter the command:

```
cleartool setview {appropriate view tag}
```

2. Set the correct path for DMS: `cd /ecs/formal/fos/dms4`
3. Ensure that the subsystem `make.targets` file has the target platform set
4. Enter the command: `source .buildrc`
5. Enter the command: `Clearmake -C GNU -V`

DMS build is complete when the Clearmake finishes

The entire Build process is complete when all the subsystems have successfully built after the FOSCOMMON. It is now possible to begin the Installation process.

## Appendix B. Installation Procedure

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This section outlines the installation procedure for the FOS custom software. The following procedures are performed following the successful build of the FOS system.

1. Login as foscm
2. Type “x &” to invoke the xclearcase tool
3. Select view from which system builds were performed
4. Select the CM/CC pull-down window option
5. Select target platform to install to (i.e., dec\_osf\_3-2)
6. Select Environment (CM Release, /cm environment)
7. Select Install S/W @ Mini-EOC
8. Select Install everything

Using the above procedures, a */fos/cm/am1* directory structure is populated with all the deliverable executables and support files required to support the delivery.

Execution of the following UNIX commands results in a tape being generated for delivery to the EOC.

1. `cd /fos/cm`
2. `tar cvf /fos/NCC1_patch.tar am1`
3. `cd /fos`
4. Insert a tape into the machine you are logged in to
5. `tar cf /dev/rmt0h NCC1_patch.tar`

Take the delivery tape to the EOC at GSFC and perform the following functions.

1. login, as root, to the machine where the delivery tape has been inserted
2. `cd /net/fosec2/fostools`
3. `tar xf /dev/rmt0h`
4. `cd /fos/test`
5. `cp am1 am1A2ECT1Orig`
6. `tar xvf /net/fosec2/fostools/NCC1_patch.tar`
7. `cd /net/fosec2/fostools`

8. tar xvf NCC1\_patch.tar
9. cp -p FdDbBuildNccOdf/fos/test/am1/bin/sun\_sparc\_5-4
10. cp -p packet\_defs\_data.sql/fos/test/am1/db
11. chown -R root am1
12. chgrp -R fosusers am1
13. chmod -R g+w am1
14. cd /fos/test/am1/scripts; chmod -R g-w setup
15. cd /fos/test/am1; chmod -R g-w bin



## **Appendix C. Special Operating Instructions**

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The README file available with this NCC1 patch for delivery is located on the tar file “NCC1\_patch.tar”. The README file has not been verified. However, it does contain valid and useful information concerning the installation instructions and the NCRs fixed by this delivery.

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## Appendix D. User Feedback Procedures

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### **Feedback from the Users**

Collating user feedback is one of the primary goals of FOS. Collected user feedback will be provided directly to the subsequent release teams for further assessment and action. Several feedback channels will be provided for effective collection of data.

#### **URDB**

Link to URDB will be provided on the FOS WEB page which is under construction.

#### **Bulletin board**

FOS bulletin board server is located on <http://newsroom.hitc.com/fos/fos.html>.

### **Non Conformance Reports (NCR)**

NCRs for FOS are submitted using the FOS NCR WEB page (URL <http://newsroom.gsfc.nasa.gov/sit/ddts/ddts.html>). This page provides a direct link to the EDF DDTs database which tracks the FOS NCRs. The access is allowed only to authorized ECS users. The procedure for submitting NCRs is explained in detail in the Project Instruction (PI) SD-1-014, Software Nonconformance Reporting.

### **Feedback to the users**

Keeping the users of the system informed about the status and operational aspects of the system is also as important as collecting feedback from the users. Consistent with this approach, users will be able to get FOS data from the following channels:

#### *Bulletin board*

Information will be posted to the bulletin board at <http://newsroom.hitc.com/fos/fos.html>.

#### *FOS WEB Page*

FOS WEB Page (under construction) will also provide useful information including access to the FOS documentation on-line.

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## Appendix E. FOS Custom Software Version 1.01.01 Tar File Listing

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The following directory listing contains the delivered custom software required to support the EOC operation and is available from the delivered TAR tapes. All of the generated run time executables are located in the /fos/test/am1/bin area. For the SUN platform the executables are located in the sun\_sparc\_5-4 subdirectory to /bin (e.g., the DynamicPage executable is located at /fos/test/am1/bin/sun\_sparc\_5-4).

The delivered tar-file “NCC1\_patch.tar” consist of:

3049	./README.txt
2646112	./FdDbBuildNccOdf
621	./ECS_COPYRIGHT.asc
25794	./packet_defs_data.sql
6019	./FdDbBuildNccOdf.C
646	./FdDbBuildNccOdfMain.C

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# Abbreviations and Acronyms

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ANA	Analysis Subsystem
CC	Change Control
CCB	Change Control Board (Hughes Convention)
CCR	Configuration Change Request
CCSDS	Consultative Committee for Space Data Systems
CDRL	Contract Deliverable Requirements List
CERES	Clouds and Earth Radiant Energy System
CI	Configuration Item
CLI	Command Line Interface
CLTU	Command Link Transmission Unit
CM	Configuration Management
CMD	Command Subsystem
CMO	Configuration Management Organization
CMS	Command Management Subsystem
COTS	Commercial off-the-shelf Software
CSMS	Communications and Systems Management Segment (ECS)
CRC	Cyclic Redundancy Code
CSC	Coordinate System Conversion
CSCI	Computer Software Configuration Item
CSS	Communication Subsystem
DAAC	Distributed Active Archive Center
DCE	Distributed Computing Environment
DCN	Document Change Notice
DDTS	Distributed Defect Tracking system
DID	Data Item Description
DMS	Data Management Subsystem

DSN	Deep Space Network
DSS	Data Server Subsystem
ECL	ECS Command Language
ECS	EOSDIS Core System
EDHS	ECS Data Handling System
EDOS	EOS Data and Operations System
EOC	EOS Operations Center
EOS	Earth Observing System
EOSAM	EOS AM Project (morning spacecraft series)
EOSDIS	EOS Data and Information System
EOSPM	EOS PM Project (afternoon spacecraft series)
ESDIS	Earth Science Data and Information System
FOP	Frame Operations Procedure
FOS	Flight Operations Segment
FOT	Flight Operations Team
ftp	File Transfer Protocol
FUI	FOS User Interface Subsystem
GSFC	Goddard Space Flight Center
GUI	Graphical User Interface
HAIS	Hughes Applied Information Systems
HITC	Hughes Information Technology Company
I&T	Integration & Test
I/O	Input/Output
IP	International Partner
ISS	Internetworking Subsystem
IST	Instrument Support Toolkit
LaRC	Langley Research Center
M&O	Maintenance and Operation
MET	Metadata



MSS	Management Subsystem
NASA	National Aeronautics and Space Administration
NCC	Network Control Center (GSFC)
NCR	Nonconformance Report
NCSA	National Center for Supercomputer Applications
PAS	Planning and Scheduling
PDB	Project Data Base
PDR	Preliminary Design Review
PI	Project Instruction or Principal Investigation
QA	Quality Assurance
RCM	Real-Time Contact Management Subsystem
RMS	Resource Management Subsystem
RRDB	Recommended Requirements Database
SCF	Science Computing Facility
SDP	Science Data Production
SDPS	Science Data Processing Segment
SDPF	Science Data Processing Facility
TBD	To Be Determined
TL	Team Leader
TLM	Telemetry Subsystem
TRMM	Tropical Rainfall Measuring Mission (joint US - Japan)
URL	Universal Research Locator
US	United States
WWW	World Wide Web

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